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The ways in which the following three factors influence a large-city school district's "fiscal performance" are investigated: (1) The educational and occupational status of school board members, (2) the effect of public vote on the budget, and (3) the effect of the size of the school district. A regression of certain budget approval variables, school district size, and wealth and characteristics of school board members was run on 14 measures of fiscal performance for a sample of 529 school districts. Some general conclusions include: (1) The conditions which the legislatures impose upon the local districts influence local fiscal policy, (2) state regulations concerning the process of budget approval affect the fiscal capability of school districts, (3) the influence of school district size has not been clarified, (4) tax limitation combined with fiscal performance hampers the school district's ability to compete economically with other agencies relying upon public support, and (5) a form of fiscal dependence without tax limitation appears to be the best present method of regulating the fiscal powers of large-city school boards. (HW)

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Board Members, the Public, and Fiscal Welfare of School Districts

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A recent Bulletin article discussed evidence showing that personal characteristics of school board members may play an important role in determining the level of school support.[1] The evidence presented was derived from a factor analysis embracing 74 fiscal and "quality related" variables and measures of occupational and educational characteristics of school board members. This was one of a series of statistical analyses of data obtained in a study of school board fiscal responsibility.[2] A full description of this work is contained in a report of Project No. 3237 to the U. S. Office of Education.[3] A shorter version which concentrates on the implications of the multivariate procedures used is available from the Institute of Administrative Research.[4]

One of these multivariate analyses explored the relation between occupational and educational characteristics of school board members and selected variables related to "fiscal performance" of the school board. The latter were treated as dependent variables and included net current expenditure per pupil, amount raised locally per pupil, various teachers' salary measures, certain categories of expenditure related to quality criteria, proportion of total local revenue going to schools, and the like. Included in the matrix as independent variables were certain characteristics associated with method of budget approval, examination of which was the central objective of the study. It had been found, however, that the influence of fiscal dependence or independence is qualified by other circumstances having to do with tax limitation, school district size (enrollment) and wealth.[5] Consequently, along with the school board variables, tax limitation and size were included, as well as public vote

[1] "School Board Member Characteristics and Fiscal Responsibility," *IAR Research Bulletin*, Vol. 7, No. 2, February, 1967.

[2] "Tax Limitation and Fiscal Responsibility of School Boards," *IAR Research Bulletin*, Vol. 7, No. 1, November, 1966 and "New Light on The Size Question," Ibid., Vol. 6, No. 2, February, 1966.

[3] Marilyn Gittell, T. Edward Hollander, and William S. Vincent, *Investigation of Fiscally Independent and Dependent City School Districts*, Cooperative Research Project No. 3237, New York: The City University Research Foundation with Subcontract to Teachers College, Columbia University, 1967.

[4] *The Influence of Statutory Controls on the Fiscal Capability of School Boards*, Institute of Administrative Research, Teachers College, Columbia University 1967. (mimeographed)

[5] *IAR Research Bulletin*, Vol. 7, No. 1, *op. cit.*

on the budget. This last had not been investigated before, the reason being that fiscal independence was in the matrix. All districts that vote on the budget are classified as fiscally independent.* Hence the inclusion of both fiscal independence and public vote in the same multivariate analysis would result in a singularity, since some information contained in the former is identical to the information contained in the latter. The multivariate analysis of variance assumes that each variable in the matrix contributes uniquely.

A further note on the analysis. The procedure was to determine the percent of the total variation (R^2) in the dependent variable accounted for by changes in the independent variable, and to test the probability (critical limit) that the variation in each X was independent of the variation in Y. The assumption underlying the procedure is that the correlation among independent variables remains the same for each district. It will be recognized by anyone familiar with actual school district situations among the states that this assumption is somewhat strained. Yet conditions are sufficiently approximate, particularly in the absence of a viable statistical alternative, to permit us to proceed with this model. Each test of significance was performed in the presence of all the other variables. That is to say, significance of an independent variable means it has a significant effect when the effect of all the other independent variables has been removed. The particular model employed eliminated cases which did not contain all data relevant to the particular analysis. This of course biases the results to some extent. The variability of the number of districts for which specific information is obtainable in a large sample remains an inherent difficulty in analysing school district inputs. However, the consistency of the relationship of the variables (with a few exceptions) among the different runs suggests that this effect was slight.

Educational and Occupational Status of Board Members

The results of this analysis are presented in Table 2. We see that school board membership appears to make a difference. A high educational level (percentage of college graduates) and immediacy of interest in schools (percentage of housewives) appear to be the most critical characteristics. The relationship of the latter factor, percentage of school board members that are housewives, to the measures of fiscal performance is undoubtedly attributable to the fact that housewives, as mothers, represent the most closely involved clientele of the schools. Any measure of percentage of parents on the board, were it available, would likely show as strong a relationship. Specifically, the significant influence of college graduates and housewives on the board is seen in net current expenditure, amount raised locally, teachers' salaries and the composite.

Other school board characteristics appear to have minor importance compared to these two. The critical level for all responses in the analysis is shown in Table 1 as an indication of the relative significance of the independent variables. *All responses* in this analysis refers to a combination of dependent variables in which greatest total change occurs when the independent variable is changed. Those who feel that retired persons on the school board work against fiscal expansion find little support for this view here. Percent farmers is more than likely an inverse measure of wealth. Also contrary to what many writers in school administration have maintained, the use of standing committees of the board does not appear a thoroughly bad thing. We see their presence significantly related to amount raised locally, teachers' salaries and debt service.

The Effect of Public Vote on the Budget

The principal feature of the data presented in Tables 1 and 2 is the outstanding position of the public vote districts. Note the relatively large percentage of the variance in net current expenditure and debt service accounted for by public vote on the budget. Significant also is the percentage of the variance in amount raised locally, the salary variables, the "quality related variables"—number of total staff, guidance counsellors, librarians and clerical personnel per 1000 pupils[6]—and in composite fiscal performance. The *all responses* critical level of the public vote variable is more significant than that of the tax limitation variable. Wealth again shows up as highly significant, but not more so than public vote. In combination with size the effect of public vote decreases; but, then, the effect of size is highly significant in itself, and negative.

A subsample was used for this run. It consisted of the 529 districts for which both school board and wealth

*Fiscal dependence is defined as the condition which requires the school board's budget to be submitted for the approval of some other agency of local government, or some state agency. Under fiscal independence the approval of another agency of government is not required. The two conditions are mutually exclusive.

[6]For a discussion of the "quality relatedness" of these inputs see "Patterns of Staff Deployment Related to School Quality," *IAR Research Bulletin*, Vol. 1, No. 3, April, 1961.

data were available. In order to test the representativeness of this sample, plots of the frequency functions of the residuals were made. For each dependent variable the estimated value was computed, based upon the prediction equation describing the assumed relationship between dependent and independent variables. This estimated value was plotted against the actual deviation of each characteristic from its estimated value. The resultant chart should exhibit a random scatter if there is no factor (independent variable) unaccounted for in the analysis. Otherwise the influence of this uncontrolled factor would be expected to show as non-randomness in the distribution. Such a chart was plotted for each of the fourteen dependent variables.

The plots are not presented here. However, the following dependent variables show highly randomized (virtually circular or oval) patterns: composite fiscal performance, all the teachers' salary measures and number of teachers per 1000 pupils. Number of clerks per 1000 pupils is relatively flat, indicating little deviation from prediction among the 529 districts. Less flat, but moderately so, and randomized patterns are exhibited by net current expenditure and expenditures for library and audio-visual aids. The pattern for amount raised locally is not random by virtue of much greater deviation above the mean of the prediction than below. The factor(s) unaccounted for here would presumably be state aid and/or some equalized measure of local effort. The plots for guidance counsellors and number of librarians per 1000 pupils are non-random. The same effect appears as in the plot for amount raised locally, although it is more exaggerated here.

It would appear safe to conclude from this that the major influences upon most of the fiscal variables have been accounted for. They seem to comprise wealth, no tax limitation, employing public vote in budget approval and hence fiscal independence, and board members who themselves are educated and have some immediate personal interest in school affairs. Size is also a factor, as has been surmised, though its influence is far from clear in this analysis.

Effect of Size Still Not Clear

It will be noted that the size effect, being negative, is opposite to its effect reported in a previous analysis where it was positive.[7] In the previous runs *size* refers to intervals, seven in number, into which the districts in the sample were grouped. In the present run *size* is actual enrollment of each district in the analysis. This is not the first time that array of data by intervals has affected results. It must be agreed that measurement of size by enrollment and not by size interval is the more precise method, and that the result of the present run is probably the more reliable. However, the discrepancy illustrates peculiarities regarding the relation of size to various other measures, and the probable non-linearity of this relation.

As we see in Table 2, the influence of size is, in general, highly significant. But while the relationship is negative, that of quadratic size is not. Size in combination with both public vote and tax limitation reduces the significance of both. It would appear from what little we can see here that there is probably such a thing as optimum size. It would also appear that the regression of

[7] *IAR Research Bulletin*, Vol. 7, No. 1, *loc. cit.*

TABLE 1
MULTIVARIATE ANALYSIS: CRITICAL LEVELS, ALL RESPONSES
Budget Approval Variables, Size, Wealth, and Characteristics of School Board Members

Independent Variable	Critical Level, All Responses, 14 Measures of Fiscal Performance
Tax Limitation	.03*
Public Vote	.00**
Tax Limitation plus Size	.22
Public Vote plus Size	.08
Number School Board Members	.09
% School Board Members College Graduates	.00**
% School Board Members Professional Occupation	.28
% School Board Members Managerial	.61
% School Board Members Clerical Occupation	.77
% School Board Members Farmers	.09
% School Board Members Foremen	.21
% School Board Members Unskilled Occupation	.40
% School Board Members Service Occupation	.59
% School Board Members Housewives	.00**
% School Board Members Retired	.05*
% School Board Members Ex-Officio	.52
Number Special Committees	.73
Number Standing Committees	.05*
Effective Buying Income 1962	.00**
Size (Enrollment)	.00**
Quadratic Size	.00**

*Significant.
**Highly significant.

TABLE 2

MULTIVARIATE ANALYSIS: VARIANCE AND CRITICAL LEVELS

Regression of Certain Budget Approval Variables, Size, Wealth and Characteristics of School Board Members on Fourteen Measures of Fiscal Performance for Subsample of 529 Districts

		1 NCE 62	2 LIB EX	3 ARL 62	4 AVG TS	5 TS DIST/ST	6 BEG TS	7 MAX TS	8 LEV 10 TS	9 TEACH/ 1000	10 GUID COUNS/ 1000	11 NO LIB/ 1000	12 NO CLR/ 1000	13 DEBT SERV. EXP.	CFP
Tax Limitation	R^2	−.001	−.003	−.001	−.003	.000	−.000	−.009	−.001	−.003	−.003	−.003	.000	−.014	−.001
	CL	.300	.230	.415	.178	.914	.631	.007*	.313	.191	.210	.172	.593	.003**	.305
Public Vote	R^2	.046	.004	.013	.029	.000	.024	.045	.020	.011	.015	.015	.013	.049	.027
	CL	.000**	.121	.003*	.000**	.598	.000**	.000**	.000**	.009*	.003*	.004*	.006*	.000**	.000**
Tax Limitation plus Size	R^2	.004	.003	.000	.006	.005	.001	.002	.000	.000	.001	.001	.008	.001	.004
	CL	.101	.176	.795	.043*	.074	.310	.182	.680	.993	.442	.477	.033*	.524	.085
Public Vote plus Size	R^2	−.013	−.003	−.003	−.006	−.001	−.007	−.008	−.002	−.005	−.009	−.012	−.010	−.011	−.007
	CL	.002*	.230	.142	.034*	.460	.027*	.011*	.193	.072	.024*	.010*	.014*	.009*	.016*
No. School Board Members	R^2	−.001	−.004	−.000	−.002	.000	−.013	−.006	−.011	.006	.000	.002	−.004	.000	−.003
	CL	.368	.163	.664	.254	.816	.002*	.034*	.005*	.004*	.836	.291	.146	.634	.155
% School Board Members College Graduates	R^2	.027	.003	.029	.017	.002	.022	.034	.026	.013	.019	.000	.012	.016	.033
	CL	.000**	.198	.000**	.001**	.237	.000**	.000**	.000**	.004*	.001**	.893	.009*	.002	.000**
% School Board Members Professional Occupation	R^2	.001	.003	.001	.006	.004	.005	.005	.003	.000	.000	.000	.000	.000	.010
	CL	.324	.214	.541	.045*	.110	.049*	.034*	.120	.997	.844	.661	.684	.835	.004*
% School Board Members Managerial Occupation	R^2	.001	.001	.001	.000	.002	.000	.000	.001	.000	.002	.000	.000	.000	.001
	CL	.435	.437	.391	.970	.245	.804	.852	.535	.698	.320	.774	.861	.616	.530
% School Board Members Clerical Occupation	R^2	.000	.001	.002	.001	.000	.001	.001	.001	.002	.000	.002	.000	.000	.001
	CL	.591	.523	.226	.478	.758	.322	.320	.495	.273	.666	.259	.817	.652	.336

% School Board Members Farmers	R^2	-.006	.002	-.008	-.004	-.001	-.007	-.003	-.010	-.006	-.006	.000	-.002	-.001	-.002
	CL	.037*	.367	.022*	.096	.491	.027*	.152	.006*	.049*	.060	.677	.326	.336	.165
% School Board Members Foremen	R^2	.001	.001	.000	.002	.001	.002	.005	.006	-.003	-.003	-.004	.000	.000	.007
	CL	.395	.547	.982	.184	.555	.174	.054	.036*	.163	.181	.152	.904	.930	.019*
% School Board Members Unskilled	R^2	.001	.000	.005	.005	.004	.003	.001	.002	.000	.002	-.005	.002	.002	.010
	CL	.314	.922	.056	.059	.131	.153	.361	.262	.994	.301	.096	.266	.257	.006*
% School Board Members Service Occupation	R^2	.000	.001	.001	.000	.000	.002	.002	.001	.000	.003	.005	.000	.000	.000
	CL	.756	.459	.507	.710	.915	.281	.244	.412	.925	.200	.100	.645	.720	.719
% School Board Members Housewives	R^2	.014	.001	.009	.037	.011	.031	.038	.027	.000	.000	.002	.009	.000	.036
	CL	.002*	.405	.011*	.000**	.011*	.000**	.000**	.000**	.800	.713	.343	.022*	.950	.000**
% School Board Members Retired	R^2	.002	.000	.001	.001	.000	.000	.004	.000	.001	.000	.002	.019	.001	.001
	CL	.271	.881	.523	.341	.975	.852	.083	.550	.389	.917	.266	.001**	.530	.342
% School Board Members Exofficio	R^2	.002	.000	.001	.000	.001	.000	.000	.001	.001	.002	.000	.001	.002	.000
	CL	.192	.815	.492	.840	.571	.840	.819	.398	.456	.278	.626	.561	.239	.744
No Special Committees	R^2	.000	.000	.002	.000	.000	.000	.000	.001	.000	.001	.007	.000	.000	.000
	CL	.642	.620	.308	.909	.681	.951	.782	.490	.901	.431	.054	.952	.999	.793
No Standing Committees	R^2	.005	.000	.008	.002	.000	.006	.015	.012	.004	.000	.001	.000	.012	.009
	CL	.051	.835	.021*	.286	.770	.040*	.001**	.003*	.127	.613	.419	.968	.006*	.009
Effective Buying Income 1962	R^2	.000	.001	.001	.001	.031	.016	.013	.017	.000	.006	.003	.004	.025	.038
	CL	.915	.449	.482	.475	.000**	.001**	.001**	.001**	.770	.066	.183	.105	.000**	.000**
Size (Enrollment)	R^2	-.029	-.002	-.012	-.002	.008	-.002	-.001	-.000	-.079	-.023	-.031	-.007	-.031	-.012
	CL	.000**	.366	.004**	.221	.028*	.281	.291	.548	.000**	.000**	.000**	.043*	.000**	.002*
Quadratic Size (Enrollment squared)	R^2	.019	.001	.012	.002	.006	.002	.002	.001	.054	.020	.024	.007	.030	.007
	CL	.000**	.602	.005*	.294	.047*	.194	.164	.445	.000**	.001**	.000**	.047*	.000**	.016*

*Significant.
**Highly significant.

size on fiscal performance is non-linear and there is the suggestion that the medium large city suffers more from size than the giant city. And, it would appear questionable whether voting on the budget would help either the large or the giant city school district in improving its fiscal position. However, it must be emphasized, proposals for dealing with the negative effects of size are still pretty much conjectural.

Some Conclusions

If one may draw some conclusions based upon the foregoing and upon the material presented in the three previous articles in these pages dealing with this study of fiscal responsibility, it would be to observe that the conditions which the legislatures impose upon the local districts do indeed influence local fiscal policy. We do find that state regulations surrounding the process of budget approval appear to make a difference in the fiscal capability of school districts. We cannot be certain that any particular method of budget approval, in and of itself, is responsible. School district size is a troublesome factor whose particular influence, aside from the likelihood that its relation to fiscal criteria is non-linear, has not been clarified. The probability is that an optimum method of budget approval, if there is such a thing, varies with school district size.

Despite its frequent difficulties for the administrator, the power of public vote on the budget to gird some school districts effectively for the fiscal wars seems clear from the evidence in hand. Those that benefit most appear to be the smaller districts rather than the larger ones. There is considerable evidence to suggest that the combination of public vote and relatively modest size (enrollment) is effective in maintaining the school district's economic position in these times.

The clearest evidence we get from this investigation relates to the matter of tax limitation. Tax limitation seriously hampers the school district in economic competition with other agencies relying upon public support. By extension, it is suggested that all agencies of public support are hampered relative to the general economy by arbitrary limitation upon their ability to benefit from general economic well being. Where there is tax limitation, fiscal dependence of school boards is greatly to be preferred. Indeed, it would appear that where tax limitation is the model that has been chosen by legislative action to restrict the fiscal powers of the state's local agents, the school boards, fiscal dependence is superior to fiscal independence.[8]

Fiscal independence appears to have some qualified superiority over fiscal dependence. The qualifications relate, as indicated above, to tax limitation, and, more particularly, they relate to size. The essence of fiscal independence is the inclusion of the ingredient of public vote on the budget. The alternative is some form of tax limitation, which we find to be a kind of poison. Without public vote or tax limitation, there is no fiscal restriction of any kind upon the local board, a situation which legislatures seek to avoid. Moreover, most districts with fiscal independence are also districts with public vote. But it is suggested by the evidence that public vote is not necessarily the best procedure for the largest districts. One would then be inclined to question the use of fiscal independence for the largest districts, since the alternative would be to subject them either to tax limitation or to the authority of some board well removed from the local influence (like, for example, the Port of New York Authority). One could hardly care for either alternative as a means of governing schools. Hence a form of fiscal dependence, exercised without tax limitation, would appear preferable among the extant methods of regulating the fiscal powers of the local school boards of the largest cities.

One alternative to this would be, of course, to break up the largest districts. If fiscally independent districts with public vote and smaller size appear best off in the fiscal competition, the argument is strong for organizing all districts in accordance with conditions that predict optimum performance. Indeed, one is at a loss to explain why those methods invented so far for rendering the stewardship of local boards responsible to the state are the only ones which have been proposed for dealing with the obvious problems of the overly large or the overly poor school district. There should be new approaches possible and a new round of creative thinking in the organization of school government.

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[8] *IAR Research Bulletin, ibid.*

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